

1 General

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2 Summary of Work

2.1 REQUIREMENTS INCLUDED

- .1 Work under this Contract includes renovations to an existing facility in Sunny Corner, NB, including all structural, architectural, mechanical, and electrical requirements.
- .2 Work shall be Substantially Completed by time stated in Bid Form.

2.2 EXAMINATION

- .1 Before submitting Bid, visit the site and examine conditions of work. Departmental Representative will arrange only one site visit.
- .2 Before commencing work, verify all relevant field dimensions.
- .3 Report to the Departmental Representative in writing, defects, faulty work or unsuitable working conditions which may affect the quality of workmanship of this project.
- .4 A site visit will be held on a date as determined by Departmental Representative. This will be the only opportunity for the review of the existing site conditions. All questions arising from the review of the site and the bid documents are to be submitted to the Contracting Officer as per Tender Documents instructions.

2.3 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Reviewed shop drawings and, if applicable, all revisions thereof
 - .5 Change Orders
 - .6 Other modifications to Contract
 - .7 Building permit(s).

2.4 CODES AND STANDARDS

- .1 Work shall conform to requirements of the National Building Code of Canada 2010 and local codes which may govern the requirements of the installation.

2.5 LAWS AND REGULATIONS

- .1 Comply with all federal, provincial, territorial, municipal or local laws and regulations of the authorities with regard to the works or having jurisdiction in the locality of the works including, but not limited to, any law, ordinance, rule or regulation of public health and safety.

2.6 PERMITS AND LICENSES

- .1 Obtain building permits and other permits and licenses required to fully comply with all laws, ordinances and regulations in connection with the performance of the works.

3 Project Coordination

3.1 GENERAL

- .1 Contractor shall provide necessary coordination between all trades on site and ensure cooperation of trades with each other.

4 Cutting, Fitting and Patching

- .1 Execute cutting, fitting and patching required to complete the work.
- .2 Remove defective and nonconforming work, and replace with new at no cost to Departmental Representative.
- .3 Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- .4 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed without prior approval.
- .5 Restore work with new products in accordance with requirements of Contract Documents.

5 Project Meetings

- .1 Schedule project meetings once every two weeks. Distribute written notice four (4) days in advance of meetings.
- .2 The Contractor shall preside at meetings, record the Minutes, and reproduce and distribute copies of Minutes to all parties.

- .3 Representatives of Contractor, subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.
- .4 Distribute copies of minutes within three (3) days after meeting.

6 Construction Schedule

- .1 Provide a construction schedule showing starting and completion dates for each sequence of work.
- .2 Work may start immediately after award of contract.
- .3 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Activities prior to start of construction activities
 - .1 Submission of Site Specific Health and Safety Plan.
 - .2 Submission of Shop Drawings, Samples.
 - .3 Procurement of permits.
 - .3 Mobilization.
 - .4 Major construction activities.
 - .5 Testing and Commissioning.
- .4 Update construction schedule monthly and include with monthly progress invoice.
- .5 Submit cash flow chart with Project Schedule and provide update monthly with progress invoice.

7 Quality Control

7.1 INSPECTION

- .1 The Departmental Representative shall have access to the work.
- .2 Give timely notice requesting inspection if work is designated for special tests, inspections or approvals by Departmental Representative instructions, or the law of the place of the work.
- .3 If the Contractor covers or permits to be covered, work that has been designated for special tests, inspections or approvals before such test is made, uncover such work, have the inspections or tests satisfactorily completed and make good such work.

7.2 REJECTED WORK

- .1 Remove defective work which has been rejected by the Departmental Representative as failing to conform to the Contract Documents. Replace or re-execute in accordance with with Contract Documents.

END OF SECTION

1 General

1.1 REFERENCES

- .1 Fire Protection Standards issued by Fire Protection Services of the Department of Human Resources and Social Development, as follows:
 - .1 FCC No. 301-June 1982, Standard for Construction Operations.
 - .2 FCC No. 302-June 1982, Standard for Welding and Cutting.

1.2 DEFINITIONS

- .1 Hot Work defined as:
 - .1 Welding work.
 - .2 Cutting of materials by use of torch or other open flame devices
 - .3 Grinding with equipment which produces sparks.
 - .4 Use of open flame torches such as for roofing work.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 10 01 - General Requirements.
- .2 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days after contract award.

1.4 FIRE SAFETY REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with following:
 - .1 National Fire Code.
 - .2 Fire Protection Standards FCC 301 and FCC 302.
 - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on course of action to be followed.

1.5 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into individual activities. Each activity requiring a separately written "Authorization to Proceed".
- .4 Requirement for individual authorization will be based on:
 - .1 Nature or phasing of work;
 - .2 Risk to Facility operations;

- .3 Quantity of various trades needing to perform hot work on project or;
- .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of the Facility. Follow Departmental Representative's directives in this regard.

1.6 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during performance of Hot Work.
- .2 Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in Section 01 35 30 - Health and Safety Requirements.
 - .2 The step-by-step process of how to prepare and issue permit.
 - .3 Permit shall be issued by Contactor's site superintendent, or other authorized person designated by Contractor, granting permission to worker or subcontractor to proceed with hot work.
 - .4 Permit required for each Hot Work event.
 - .5 Designation of a person on site as Fire Safety Watcher, to carry out a Fire Safety Watch for a minimum of 120 minutes immediately upon completion of the Hot Work.
 - .6 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
 - .7 Site specific rules and procedures in force at the site as provided by the Facility Manager.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific Project conditions. Label document as being the Hot Work Procedures for this contract.
- .4 Procedures shall clearly establish responsibilities of:
 - .1 Worker,
 - .2 Authorized person issuing Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractor(s) and Contractor.
 - .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.
 - .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification with disciplinary measures imposed as specified in Section 01 35 30 - Health and Safety Requirements.

1.7 HOT WORK PERMIT

- .1 Hot Work Permit to include the following:
 - .1 Project name and project number;
 - .2 Building name and specific room or area where hot work will be performed;
 - .3 Date of issue;
 - .4 Description of work type to be performed;

- .5 Special precautions required, including type of fire extinguisher needed;
 - .6 Name and signature of permit issuer.
 - .7 Name of worker (clearly printed) to which the permit is issued.
 - .8 Permit validity period, not to exceed 8 hours. Indicate start time/date and termination time/date.
 - .9 Worker's signature with time/date of hot work completion.
 - .10 Specified time period requiring safety watch.
 - .11 Fire Safety Watcher's name and signature complete with time and date; certifying that surrounding area was under his continual surveillance and inspection during the full watch period and commenced immediately upon completion of Hot Work.
- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
 - .3 Each Hot Work Permit to be completed in full, signed as follows:
 - .1 By permit issuer before Hot Work commences;
 - .2 By Worker upon completion of Hot Work;
 - .3 By Fire Safety Watcher upon termination of safety watch;
 - .4 returned to Contractor's Superintendent for safe keeping on site.

1.8 FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- .3 Costs incurred, from the fire department, Facility owner and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

1.9 DOCUMENTS ON SITE

- .1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.
- .2 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

2 Products

2.1 NOT USED

- .1 Not Used.

3 Execution

3.1 NOT USED.

- .1 Not Used.

END OF SECTION

1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CSA C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
 - .2 CAN/CSA C22.3 No.1-06 - Overhead Systems.
 - .3 CSA C22.3 No.7-06 - Underground Systems.
- .2 Canada Occupational Health and Safety (COSH)
 - .1 Regulations made under Part II of the Canada Labour Code.

1.2 DEFINITIONS

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
- .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.3 COMPLIANCE REQUIREMENTS

- .1 Perform lockouts in compliance with:
 - .1 Canadian Electrical Code.
 - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations.
 - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
 - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on course of action to be followed.

1.4 SUBMITTALS

- .1 Submit in accordance with Section 01 10 01 - General Requirements.

- .2 Submit copy of proposed lockout procedures and sample of lockout permit or lock out tags for review.
- .3 Submit documentation within 21 calendar days of contract award. Do not proceed with work until submittal has been reviewed by Departmental Representative.
- .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

1.5 ISOLATION OF EXISTING SERVICES

- .1 Obtain Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
 - .1 Written request to isolate the particular service or facility and;
 - .2 Copy of Contractor's Lockout Procedures.
- .3 Make Request for Isolation for each event, unless directed otherwise by Departmental Representative, as follows:
 - .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
 - .2 Where no form exist, make written request indicating:
 - .1 The equipment, system or service to be isolated and its location;
 - .2 Duration of isolation period (ie: start time & date and completion time and date).
 - .3 Voltage of service feed to system or equipment being isolated.
 - .4 Name of person making the request.
 - .3 Document to be in typewritten format.
- .4 Do not proceed until receipt of written notification from Departmental Representative granting the Isolation Request and authorizing to proceed with the work.
 - .1 Departmental Representative may designate another person at the Facility as being authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.
- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
- .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of Facility) operations. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 30 - Health and Safety Requirements.

1.6 LOCKOUTS

- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.
- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.

- .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .4 Use industry standard lockout tags.
- .5 Provide appropriate safety grounding and guards as required.
- .6 Prepare type written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site to safely isolate potential energy sources and lockout/tagout facilities and equipment.
- .7 Include within Procedures a system of requests and issuance of individual lockout permits managed by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
 - .1 Issuance of permits and lockout tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Submitting a Request for Isolation to Departmental Representative when required as specified above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to workers prior to proceeding with work.
 - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
- .8 Clearly establish, describe and allocate responsibilities of:
 - .1 Workers.
 - .2 Person managing the lockout tags/permit system.
 - .3 Safety Watcher.
 - .4 Subcontractors and General Contractor.
- .9 Procedures shall meet requirements of Codes and Regulations.
- .10 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
 - .1 Incorporate site specific rules and procedures in force at site as provided by Facility Manager through the Departmental Representative.
 - .2 Clearly label document as being Lockout procedures applicable to work of this contract.

1.7 CONFORMANCE

- .1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.
- .2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance Notification as specified in Section 01 35 30 - Health and Safety Requirements.

1.8 DOCUMENTS ON SITE

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.
- .3 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

- 2 Products
- 2.1 NOT USED
 - .1 Not Used.
- 3 Execution
- 3.1 NOT USED
 - .1 Not Used.

END OF SECTION

1 General

1.1 DEFINITIONS

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
 - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
 - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
 - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4 PPE: personal protective equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 10 01 - General Requirements.
- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
 - .1 Submit within 15 work days of notification of Bid Acceptance. Provide three (3) copies.
 - .2 Departmental Representative will review Health and Safety Plan and provide comments.
 - .3 Revise the Plan as appropriate and resubmit within five (5) work days after receipt of comments.
 - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
 - .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.

- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.3 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and General Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at: [www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
 - .2 COSH can be viewed at: [www.http://laws.justice.gc.ca/eng/SOR-86-304/n_e.html](http://laws.justice.gc.ca/eng/SOR-86-304/n_e.html)
 - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)
- .3 Observe construction safety measures of:
 - .1 Part 8 of National Building Code
 - .2 Municipal by-laws and ordinances.
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.4 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.5 SITE CONTROL AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
 - .1 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
 - .2 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.6 PROTECTION

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.7 FILING OF NOTICE

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.
 - .1 Departmental Representative will assist in locating address if needed.

1.8 PERMITS

- .1 Post permits, licenses and compliance certificates, specified in section 01 10 01 - General Requirements, at Work Site.
- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.9 HAZARD ASSESSMENTS

- .1 Perform site specific health and safety hazard assessment of the Work and its site.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.
- .3 Record results and address in Health and Safety Plan.
- .4 Keep documentation on site for entire duration of the Work.

1.10 MEETINGS

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
 - .1 Superintendent of Work
 - .2 Designated Health & Safety Site Representative
 - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.11 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
- .2 Health and Safety Plan shall include the following components:
 - .1 List of health risks and safety hazards identified by hazard assessment.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-site Communication Plan as specified below.
 - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
 - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
 - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
 - .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
 - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
 - .4 Emergency Contacts: name and telephone number of officials from:
 - .1 General Contractor and subcontractors.
 - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
 - .3 Local emergency resource organizations.
 - .5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.
- .4 On-site Communication Plan:
 - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
 - .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.
- .5 Address all activities of the Work including those of subcontractors.
- .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
- .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
- .8 Post copy of the Plan, and updates, prominently on Work Site.

1.12 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
 - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
 - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
 - .3 Conduct site safety orientation session to persons granted access to Work Site.
 - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
 - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
 - .1 Be qualified and competent person in occupational health and safety.
 - .2 Have site-related working experience specific to activities of the Work.
 - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
 - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
 - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
 - .3 Follow-up and ensure corrective measures are taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

1.13 TRAINING

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
- .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.14 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
 - .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.
 - .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
 - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
 - .4 Obey warning signs and safety tags.
- .2 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.

1.15 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.16 INCIDENT REPORTING

- .1 Investigate and report the following incidents to Departmental Representative:
 - .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
 - .2 Medical aid injuries.
 - .3 Property damage in excess of \$10,000.00,
 - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.
- .2 Submit report in writing.

1.17 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to Departmental Representative.

1.18 BLASTING

- .1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

1.19 POWDER ACTUATED DEVICES

- .1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

1.20 CONFINED SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.

1.21 SITE RECORDS

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.22 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.

- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan
 - .2 WHMIS data sheets.

- 2 Products
 - 2.1 NOT USED
 - .1 Not Used.

- 3 Execution
 - 3.1 NOT USED
 - .1 Not Used.

END OF SECTION

1 General

1.1 REFERENCES

- .1 The New Brunswick Department of Transportation
 - .1 Environmental Management Manual, January 2010.
 - .2 Standard Specifications for Highway Construction, January 2015.

1.2 FIRES

- .1 Fires and burning of rubbish and construction waste materials not permitted on site.

1.3 DISPOSAL OF WASTE

- .1 Do not bury rubbish and waste material on site.
- .2 Do not dispose of waste and volatile materials, such as mineral spirits, oil and paint thinner into waterways, storm and sanitary sewers.

1.4 PRECAUTIONARY MEASURES

- .1 Prevent discharge of material into environment. Provide necessary procedures, materials, equipment, and labour for prevention of discharges.
- .2 Report to Departmental Representative, spills on site of substances introduced to site by Contractor (e.g. fuel, lubricants). Adhere to spill reporting and remedial requirements as outline in provincial and federal legislation.
- .3 Take necessary measures to remedy effects of spills, whether of hazardous or non-hazardous substances, and to assume full financial liability for remedial measures required.

1.5 PERMITS AND APPROVALS

- .1 Obtain copies of permits and approvals issued by approval agencies. Review and comply with conditions contained in permits and approvals.
- .2 Be responsible for obtaining permits and approvals that are required, but not obtained at time of bidding.
- .3 Be responsible to obtain and pay for required permits.
- .4 Ensure staff and subcontractors are aware of terms and conditions of permit and approval issues and ensure compliance.
- .5 Traffic control is considered part of contractor's work.

1.6 EQUIPMENT MAINTENANCE

- .1 Contain, handle and dispose of maintenance fluids in accordance with New Brunswick Department of Environment regulations. Spillage on ground is prohibited. Report spills to the Environmental emergency number: 1-800-565-1633

2 Products

2.1 NOT USED

- .1 Not Used.

- 3 Execution
- 3.1 NOT USED
 - .1 Not Used.

END OF SECTION

1.1 GENERAL

- .1 Due to nature of the Work and client operations on the site, security regulations pertaining to the site and existing operations, access will be in place during the work resulting in need for:
 - .1 Control and limit of movement of construction workers at the site.
 - .2 All workers must undergo a security clearance process prior to engaging in any site work.
 - .3 Specific rules and regulations as specified in this section and as directed by the Departmental Representative to be stringently followed.
- .2 It is the Contractor's responsibility to:
 - .1 Designate a Contractor Security Representative. This representative will coordinate with all subtrades and workers for submissions of necessary security documentation.
 - .2 Insure all workers that are intended to be onsite obtain RCMP security clearances;
 - .3 Become familiar with and abide by security rules and regulations;
 - .4 Brief all workers and subcontractors in respect of the security regulations and ensure that they abide by all rules and directives.
- .3 The Departmental Representative will coordinate a pre-construction meeting between Contractor and Security Personnel who will provide details and directives on control and movement on site.
- .4 Any infraction of site security regulations on the part of the Contractor, members of work force or any Subcontractor in their employ, will result in immediate removal of offending party from the site.

1.2 SECURITY PERSONNEL

- .1 The Departmental Representative will obtain services of security personnel, employed by the Canadian Corps of Commissionaires to provide escort and security supervision of all workers during the work of this contract.
- .2 Departmental Representative will pay costs for security personnel.
- .3 Commissionaires will be provided when required to perform supervision or escort function as may be needed due to Contractor's work operations such that no worker is left unsupervised if work is required to take place inside occupied building(s) on site.
- .4 Escort and supervision of workers by commissionaire, when required by the Work, will be provided at all times when work of the Contract is being performed regardless of whether this is during regular business hours or beyond.
- .5 Commissionaire will report directly to the Departmental Representative and ensure that site security directives are obeyed by all workers.
- .6 Ensure commissionaire(s) under goes contractor site safety orientation. Commissionaire(s) are to comply with contractor's safety policies applicable to this project including all required personnel protective equipment.

1.3 SECURITY CLEARANCE REQUIREMENTS

- .1 All persons employed by Contractor or by subcontractors who will be working on site must undergo the following check:

- .1 Apply for RCMP personnel security clearance screening and obtain a clearance ranging from a Facility Access up to Reliability Status. This will vary as the Contractor involvement and access requirements during and after construction.
- .2 For work within unoccupied areas all workers must at minimum obtain a Facility Access 1X clearance.
- .2 Persons who do not have security clearance, as specified above, may not be allowed access to the construction site.
- .3 Departmental Representative will advise when worker security clearance has been received and whether escort and supervision is still needed for any worker.
- .4 Escort and supervision functions specified herein are still required on the project after workers having obtained security clearance.

1.4 SECURITY CLEARANCE APPLICATION

- .1 Within 2 weeks following notification of acceptance of bid, contractor to commence submissions of application forms for all workers who require security clearance.
 - .1 Contractor security representative to prioritize worker's application submissions with the phasing of construction activities.
- .2 To obtain Facility Access (FA) 1X or 2X Security Screening Status clearance, the following information is required for each applicant.
 - .1 "Personnel Screening, Consent and Authorization Form" (Form No. TBS/SCT #330-23E, Rev. 2006/02) completed by each worker.
 - .1 Part A: by RCMP Project Manager.
 - .2 Part B: by applicant. Provide full name, including middle name (not simply an initial). Ensure address listed represent last five (5) years of residence and each address is fully completed including postal code. Print data in clear, legible manner.
 - .3 Part C: only boxes 1, 2, 3 and 5 need be completed, requiring applicant's initials.
 - .2 Proof of applicant's identity consisting of a picture ID such as a valid Canadian Motor Vehicle Driver's License or other similar official ID card. Provide copy of both front and back of Driver's License or Governmental ID. Applicants must sign copy.
- .3 Fingerprinting may be required depending on level of security requirements and if previous criminal conviction exists.
- .4 Departmental Representative will provide details as to what procedures, location and time where workers must go if fingerprints are required.
- .5 Processing Time:
 - .1 The RCMP departmental processing time to obtain basic security clearances is estimated to be 4 weeks from date of receipt of required documentation.
 - .2 To avoid delays, prepare worker documentation as soon as possible. Documentation is to be submitted as one package for all applicant
 - .3 Contractor's Security Representative shall ensure forms are fully completed, signed and that all information and photo identification is clear and legible. Incomplete applications will result in immediate rejection by Departmental Representative.
 - .4 Be aware that processing time for applicants requiring higher level security requirements or those with criminal convictions may take longer and could extend the clearance waiting period significantly.

- .1 An interview with such applicant may also be required as part of the security clearance process.
- .6 To obtain RCMP Reliability Status additional security forms and screening will be required. For those workers requiring this clearance please see Departmental Representative for additional instructions.
- .7 The Contractor and/or Contractor Security Representative is to facilitate workers security clearance process as follows:
 - .1 Prepare comprehensive list of workers who will require security clearance throughout project, including those of subcontractors.
 - .2 Provide copy of list to Departmental Representative.
 - .3 Coordinate and expedite submission in preparing and submitting documentation.
 - .4 Brief and assist applicants in preparing and submitting documentation.
 - .5 Review documentation of each applicant for completeness before submission.
 - .6 Have each worker keep a copy of their completed application form in case the initial submission gets lost.
 - .7 Submit documentation in an organized manner with transmittal letter clearly identifying project and company employee is affiliated with.
- .8 Send submission(s) directly to Departmental Representative or to the approved mailing address as directed by Departmental Representative.
- .9 Persons who have not been successful in obtaining security clearance, upon documentation review by RCMP, will not be allowed further access on site.

1.5 SECURITY PASSES

- .1 All personnel, visitors or workers requiring access to occupied areas require a HRMIS number issued by RCMP. It is the responsibility of the Contractor and all personnel, visitors and workers to know their HRMIS number.
- .2 Security passes are not required for unoccupied areas.

1.6 SECURITY CONTROL LIST

- .1 Provide a list of employee names from work force and from subcontractors who will be present at site during the course of work.
- .2 List to include each person's name, address and telephone number.
- .3 Submit copy of list to Departmental Representative and to Security Commissionaire for control of workers.
- .4 Update list as work progresses.
- .5 Ensure that each worker can provide proof of identity upon demand, when requested by Security Personnel or Departmental Representative.

1.7 BUILDING ACCESS

- .1 Keys and security access cards given to the commissionaire for his sole possession, as determined by Departmental Representative, shall not under any circumstances be given to any worker or subcontractor.
- .2 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.
- .3 Immediately report to Departmental Representative any lost, stolen or destroyed keys and door security access cards.

1.8 SITE SECURITY

- .1 When work must be carried out during hours beyond the work hours previously agreed upon at start of work, provide notice within 48 hours beforehand to minimize impact on security and other operations on site.

END OF SECTION

1 General

1.1 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
 - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over two (2) sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00 - Closeout Submittals.
- .3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

1.3 ACCESS TO WORK

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

1.4 REJECTED WORK

- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
- .2 Make good damages to new and existing construction and finishes resulting from removal or replacement of defective work.

- 2 Products
- 2.1 NOT USED
 - .1 Not Used.
- 3 Execution
- 3.1 NOT USED
 - .1 Not Used.

END OF SECTION

1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CAN/CSA-Z321-96 (R2006), Signs and Symbols for the Workplace.

1.2 SITE ACCESS AND PARKING

- .1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.
- .2 The Contractor is advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.
- .3 Parking facilities at site is limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.
- .4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.

1.3 BUILDING ACCESS

- .1 Use only access doors, and circulation routes within building as designated by Departmental Representative to access interior work.

1.4 CONTRACTOR'S SITE OFFICE

- .1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

1.5 MATERIAL STORAGE

- .1 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.
- .2 Make arrangements elsewhere in area as deemed required and pay all costs for storage of materials not ready for incorporation into work.

1.6 INTERIOR DUST CONTROL AND DUST BARRIERS

- .1 Control creation and spread of dust and dirt to building interior and in particular to areas within premises still under use by occupants.
- .2 Develop and implement a dust control plan, addressing effective measures to carry out work with least amount of dust being created and propagated.
 - .1 Carefully evaluate the type of work to be undertaken and the physical layout of each work area on site.
 - .2 Provide specifically tailored strategy for each work area.
 - .3 Pre-determine location and placement of dust barriers to confine resulting dust to immediate work area.
 - .4 Inform Departmental Representative of the proposed dust control measures to be followed at each work area and for each major dust generating activities. Obtain Departmental Representative's approval before proceeding with work.

- .3 Meager attempts at controlling dust will not be tolerated. Failure to provide effective dust control during work and to perform satisfactory cleaning thereafter will result in Departmental Representative to proceed and obtain a separate cleaning service agency to perform cleaning to tenant's satisfaction with cost for such services being charged against this Contract in the form of financial holdbacks.
- .4 Obtain Departmental Representative's approval before erecting any dust partitions simply to underside of finish ceiling.
- .5 Construction of dust barriers, enclosures and placement of temporary protective devices to be performed during Facility non-operational off-hour periods.

1.7 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Departmental Representative.

1.8 ENCLOSURE OF STRUCTURE

- .1 Provide temporary weathertight enclosures and protection for exterior openings until permanently enclosed.
- .2 Provide weathertight and heated enclosures to conduct exterior work during winter and other inclement weather conditions. Erect to allow accessibility for installation of materials and working inside of enclosure.
- .3 Design enclosures to withstand wind pressure and snow loading.

1.9 POWER

- .1 Power supply is available and will be provided for construction usage at no cost.
 - .1 Make arrangements for the use of such services through the Departmental Representative.
 - .2 Departmental Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.
 - .3 Connect to existing power supply in accordance with Canadian Electrical Code.
- .2 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162 lx in all locations.

1.10 WATER SUPPLY

- .1 Water supply is available in existing building and will be provided for construction usage at no cost. Make arrangements for the use and transportation of such services to work area through the Departmental Representative.
- .2 Permanent water supply system installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.

1.11 HEATING AND VENTILATING

- .1 Submit bid assuming existing equipment and systems will not be used for temporary heating and ventilating.
- .2 Upon acceptance of bid, Departmental Representative may permit use of permanent system providing agreement can be reached on:
 - .1 Conditions of use, special equipment, protection and maintenance.
 - .2 Saving on Contract price.
 - .3 Provisions relating to warranties on equipment.

1.12 CONSTRUCTION SIGN AND NOTICES

- .1 Upon request by Departmental Representative, erect a self-supporting project sign in location indicated.
- .2 Departmental Representative will provide a vinyl sign facing for installation by Contractor on sign framework. Sign frame to be plywood face of approximately 1200 mm x 2400 mm in size complete with required wood framing at 400 mm o.c. and support posts.
- .3 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.
- .4 Contractor or subcontractor advertisement signboards are not permitted on site.
- .5 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN/CSA-Z321.
- .6 Maintenance and Disposal of Site Signs:
 - .1 Maintain approved signs and notices in good condition for duration of project and dispose of off-site on completion of project or earlier if directed by Departmental Representative.

1.13 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.
- 2 Products
- 2.1 NOT REQUIRED
 - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
 - .1 Not Required.

END OF SECTION

1 General

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within seven (7) days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Compliance to specified standards.
 - .5 Manufacturer's installation or application instructions.
 - .6 Evidence of arrangements to procure.
 - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 PRODUCT QUALITY

- .1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
- .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions of the Contract.

1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES

- .1 Acceptable Materials: When materials specified include trade names or trade marks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.
- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.
- .3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

1.4 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.

1.5 AVAILABILITY

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per paragraph 1.1.2 above.

1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.
- .3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS - GENERAL

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See section on Health and Safety Requirements in this regard.

1.8 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

1.9 STORAGE, HANDLING AND PROTECTION

- .1 Deliver, handle and store materials in manner to prevent deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.

- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
 - .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
 - .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
 - .8 Immediately remove damaged or rejected materials from site.
 - .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 2 Products
- 2.1 NOT REQUIRED
 - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
 - .1 Not Required.

END OF SECTION

1 General

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

1.2 MATERIALS

- .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 CLEANING DURING CONSTRUCTION

- .1 Maintain work areas in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
- .2 Keep building entrances, corridors, stairwells and tenant occupied areas of building in a clean dust free condition at all times. Conduct thorough cleaning of these areas at end of each work shift when used by workers or affected by the Work.
- .3 Provide on-site dump containers for collection of waste materials and debris.
- .4 Use separate collection bins, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified.
- .5 Remove waste materials, and debris from site on a daily basis.
- .6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .7 Provide dust barriers, dividers, seals on doors and employ other dust control measures as required to ensure that dust and dirt, generated by work, are not transmitted to other areas of building. Should dust migrate into tenant occupied or public areas of building, employ such means as may be necessary to immediately clean all contaminated surfaces to the satisfaction of the Departmental Representative.
 - .1 See Section 01 50 00 - Temporary Facilities for requirements on dust control and for erection of dust partitions.
- .8 Immediately clean all dust, dirt, smears, scuffs and soiled surfaces in lobbies, corridors, stairwells, and within tenant occupied areas resulting from the Work.
 - .1 Perform cleaning, dusting and washing operations, carpet vacuuming (including shampooing if deemed required by Departmental Representative) and floor washing as necessary to thoroughly clean all soiled surfaces.
- .9 Remove snow and ice from access doors used by workforce

1.4 FINAL CLEANING

- .1 In preparation for acceptance of the completed work perform final cleaning.

- .2 Remove grease, dust, dirt, stains, labels, fingerprints, marks and other foreign materials, from interior and exterior finished surfaces. Clean and polish surfaces including glass, mirrors, hardware, wall tile, stainless steel, chrome, baked enamel, plastic laminate, mechanical and electrical fixtures.
 - .3 Replace items with broken pieces, scratches or disfigured.
 - .4 Clean lighting reflectors, lenses, and other lighting surfaces.
 - .5 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .6 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
 - .7 Remove debris and surplus materials from crawl areas, roof areas and other accessible concealed spaces.
 - .8 Clean equipment, and washroom fixtures to a sanitary condition.
- 2 Products
- 2.1 NOT REQUIRED
 - .1 Not Required.
- 3 Execution
- 3.1 NOT REQUIRED
 - .1 Not Required.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.

1.2 RELATED REQUIREMENTS

- .1 Section 01 10 01 - General Requirements.

1.3 INSPECTION AND DECLARATION

- .1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
 - .1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
 - .2 Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.
 - .1 Address defects, faults and outstanding items of work identified by such inspections.
 - .2 Advise Departmental Representative when all deficiencies identified have been rectified.
 - .3 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
 - .1 Project record as-built documents;
 - .2 Final Operations and Maintenance manuals;
 - .3 Maintenance materials, parts and tools;
 - .4 Compliance certificates from applicable authorities;
 - .5 Reports resulting from designated tests;
 - .6 Demonstration and training complete with user manuals;
 - .7 Manufacturer's Guarantee certificates.
 - .8 Testing, adjusting and balancing of equipment and systems complete with submission of test reports.
 - .9 Commissioning of equipment and systems specified.
 - .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

2 Products

2.1 NOT REQUIRED

- .1 Not Required.

- 3 Execution
- 3.1 NOT REQUIRED
 - .1 Not Required.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Project Record Documents.
- .2 Operations and Maintenance data.

1.2 RELATED REQUIREMENTS

- .1 01 79 00 - Demonstration and Training.

1.3 PROJECT RECORD DOCUMENTS

- .1 Departmental Representative will provide 2 white print sets of contract drawings and two (2) copies of Specifications Manual specifically for "as-built" purposes.
- .2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.
- .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative upon request.
- .4 As-Built Drawings:
 - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).
 - .2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.
 - .3 Stamp all drawings with "As-Built Drawings". Label and place Contractor's signature and date.
 - .4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
 - .5 Record following information:
 - .1 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
 - .2 Field changes of dimension and detail;
 - .3 Location of all capped or terminated services and utilities.
 - .4 Chases for mechanical, electrical and other services;
 - .5 Ceiling and floor elevations;
 - .6 Reflected ceiling plan condition showing finished layout of all ceiling-mounted services and devices;
 - .7 Plumbing, heating, air conditioning and ventilation, sprinkler and electrical service installation locations; all to be dimensioned and referenced to building columns or load bearing walls;
 - .8 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
 - .9 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
- .5 As-built Specifications: legibly mark in red each item to record actual construction, including:
 - .1 Changes made by Addenda and Change Orders.

- .2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above paragraph.
 - .6 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.
- 1.4 REVIEWED SHOP DRAWINGS
- .1 Provide a complete set of all shop drawings reviewed for project to incorporate into each copy of the Operations & Maintenance manuals.
 - .2 Submit full sets at same time and as part of the contents of the Operation and Maintenance manuals specified.
- 1.5 OPERATIONS & MAINTENANCE MANUAL
- .1 O&M Manual - Definition: an organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual products or systems as specified in individual sections of the specifications.
 - .2 Manual Language: final manuals to be in both English and French languages.
 - .3 Number of copies required:
 - .1 Upon review and acceptance by Departmental Representative, submit three (3) final copies. Interim copies are not to be considered as part of the final copies unless they have been fully revised and are identical to the final approved version.
 - .4 Submission Date: submit complete operation and maintenance manual to Departmental Representative three (3) weeks prior to application for Certificate of Substantial Performance of the work.
 - .5 Binding:
 - .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual.
 - .2 Use vinyl, hard covered, 3 "D" ring binders, loose leaf, sized for 215 x 280 mm paper, with spine pocket.
 - .3 Where multiple binders are needed, correlate data into related consistent groupings.
 - .4 Identify contents of each binder on spine.
 - .5 Organize and divide data following same numerical system as the section numbers of the Specification Manual.
 - .6 Dividers: separate each section by use of cardboard dividers and labels. Provide tabbed fly leaf for each individual product and system and give description of product or component.
 - .7 Type lists and notes. Do not hand write.
 - .8 Drawings, diagrams and manufacturers' literature must be legible. Provide with reinforced, punched binder tab. Bind in with text; fold larger drawings to size of text pages.
 - .6 Manual Contents:
 - .1 Cover sheet containing:
 - .1 Date submitted.

- .2 Project title, location and project number.
- .3 Names and addresses of Contractor, and all Sub-contractors.
- .2 Table of Contents: provide full table of contents in each binder(s), clearly indicate which contents are in each binder.
- .3 List of maintenance materials.
- .4 List of spare parts.
- .5 List of special tools.
- .6 Original or certified copy of warranties and product guarantees.
- .7 Copy of approval documents and certificates issued by Inspection Authorities.
- .8 Copy of reports and test results performed by Contractor as specified.
- .9 Product Information (PI Data) on materials, equipment and systems as specified in various sections of the specifications. Data to include:
 - .1 List of equipment including manufacturer's name, supplier, local source of supplies and service depot(s). Provide full addresses and telephone numbers.
 - .2 Nameplate information including equipment number, make, size, capacity, model number and serial number.
 - .3 Parts list.
 - .4 Installation details.
 - .5 Operating instructions.
 - .6 Maintenance instructions for equipment.
 - .7 Maintenance instructions for finishes.
- .7 Shop drawings:
 - .1 Include complete set of reviewed shop drawings into each copy of the operations and maintenance manual.
 - .2 Fold and bind material professionally in a manner that corresponds with the specification section numbering system.
 - .3 When large quantity of data is submitted, place into separate binders of same size as O&M binders.
- .8 Equipment and Systems Data: the following list indicates the type of data and extent of information required to be included for each item of equipment and for each system:
 - .1 Description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - .4 Manufacturer's printed operation and maintenance instructions.
 - .5 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - .6 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
 - .7 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 - .8 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

- .9 Include test and balancing reports.
- .10 Additional requirements as specified in individual specification sections.
- .9 Materials and Finishes Maintenance Data:
 - .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
 - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - .3 Additional Requirements: as specified in individual specifications sections.
- 1.6 SPARE PARTS, TOOLS AND MAINTENANCE MATERIALS
 - .1 Provide spare parts, special tools and extra materials for maintenance purposes in quantities specified in individual specification sections.
 - .2 Tag all items with associated function or equipment.
 - .3 Provide items of same manufacture and quality as items in Work.
 - .4 Deliver to site in well packaged condition. Store in location as directed by Departmental Representative.
 - .5 Clearly mark as to contents indicating:
 - .1 Part number.
 - .2 Identification of equipment or system for which parts are applicable.
 - .3 Installation instructions or intended use as applicable.
 - .4 Name, address and telephone number of nearest supplier.
 - .6 Prepare and submit complete inventory list of items supplied. Include list within Maintenance Manual.
- 2 Products
 - 2.1 NOT REQUIRED
 - .1 Not Required.
- 3 Execution
 - 3.1 NOT REQUIRED
 - .1 Not Required.

END OF SECTION

1 General

1.1 RELATED REQUIREMENTS

- .1 Operations and Maintenance Manual: Section 01 78 00 - Closeout Submittals.

1.2 DESCRIPTION

- .1 Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel prior to date of final inspection.
- .2 Departmental Representative will provide a list of Owner's personnel to receive instructions,
- .3 Cooperate with Departmental Representative in coordinating time and attendance of Owner's personnel with manufacturer's training Representative(s).

1.3 QUALITY CONTROL

- .1 Ensure that only personnel from own forces, Subcontractors or Suppliers competent and fully knowledgeable in the particular material component, equipment or system installation are used to provide training and demonstrations.
- .2 When specified in individual Sections, obtain the manufacturers authorized Representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.
- .3 Upon request, provide evidence to Departmental Representative of individual Trainor's knowledge and qualifications.

1.4 SUBMITTALS

- .1 Submit schedule of time, date and complete list of equipment and systems for which demonstration and training sessions will be provided. Submit schedule a minimum of two (2) weeks prior to designated dates, for Departmental Representative's approval.
- .2 Submit report within one (1) week after completion of demonstration, that demonstration and instructions have been satisfactorily completed. Provide time and date of when each demonstration was actually given, with list of persons present.

1.5 CONDITIONS FOR DEMONSTRATIONS

- .1 Prior to carrying out demonstration and training, ensure that equipment has been inspected and tested, is fully operational, has been performance verified and TAB has been carried out.
- .2 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6 PREPARATION

- .1 Verify that conditions for demonstration and instructions comply with requirements.
- .2 Verify that designated personnel are present.

1.7 DEMONSTRATION AND INSTRUCTIONS

- .1 Include the following items within the demonstration and training:
 - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each of equipment.
 - .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
 - .3 Review contents of manual in detail to explain all aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.
 - .5 Provide other specific training and instructions as specified in trade sections.

1.8 TIME ALLOCATED FOR INSTRUCTIONS

- .1 Observe the allocated time period specified in trade sections. Provide additional time when required to ensure all personnel fully understand all aspects of the information and instructions being provided. Allow for questions by participants.

2 Products

2.1 NOT REQUIRED

- .1 Not Required.

3 Execution

3.1 NOT REQUIRED

- .1 Not Required.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 This section deals with commissioning activities to occur during the construction stage and the early period of facility occupancy stage.
- .2 Section includes:
 - .1 Commissioning activities to be performed by the Contractor who is assigned membership on a Commissioning Team as part of the contract requirements.
 - .2 Commissioning activities to be performed by other members of the Commissioning Team.
- .3 In general, Contractor's commissioning activities consists of performing specified tasks and functions to assist the Commissioning Agent, along with other members of the commissioning team who will commission various components and systems of the Facility.

1.2 RELATED REQUIREMENTS

- .1 Section 01 78 00 - Closeout Submittals: Operations and Maintenance Manuals.
- .2 Section 01 79 00 - Demonstration and Training: Demonstration and Training.

1.3 BACKGROUND INFORMATION

- .1 Historically in the past, the term commissioning has been used in reference to the process used to conduct testing, adjusting and balancing of the heating, ventilation and air conditioning (HVAC) systems of a building.
- .2 Commissioning (or the commissioning process), as understood by PWGSC, is a planned program of activities conducted in concert with other activities performed during each stage of project delivery.
 - .1 The commissioning process identifies issues during the Planning and Design stages which are addressed during the Construction and Occupancy Stages of a Facility to ensure that the built facility is constructed and proven to operate satisfactorily under all weather, environmental and occupancy conditions to meet operational and user requirements.
 - .2 Commissioning activities during the Construction stage incorporates a third party verification process and a transfer of critical operational knowledge to Facility personnel.

1.4 COMMISSIONING OBJECTIVES

- .1 A Commissioning Plan has been prepared by the Design Consultant, on behalf of PWGSC, which identifies, among other issues, specific commissioning activities to be carried out by the commissioning team during the Construction of the project.
- .2 The commissioning activities have the following objectives:
 - .1 Collect data on equipment and systems being supplied and document their installation;
 - .2 Conduct checks and tests on fully installed building components, equipment, systems and integrated systems to:
 - .1 Verify whether they operate in accordance with requirements of Contract Documents;

- .2 Verify performance against design criteria and user requirements and measure peak capacities;
 - .3 Prepare a Building Management Manual (BMM) which contains operations and maintenance data, as-built record documents, commissioning reports, training data and other critical information for future use by Facility operational staff;
 - .4 Ensure transfer of knowledge on the operations, maintenance and management of the Facility to Tenant and Operational personnel by means of appropriate training.
- .3 Work to achieve the above objectives requires a collaborative effort from all members of the commissioning team.
- .1 Contractor's commissioning activities and responsibilities are described in Article 1.8 below.
 - .4 Commissioning activities performed by the Commissioning Agent and the Design Consultant does not replace checks, tests, adjustments, balancing and other performance verification procedures to be carried out by the Contractor as an integral part of performing the Work of this contract as specified in other sections of the Specifications.

1.5 SYSTEMS TO BE COMMISSIONED

- .1 The following systems and controls, complete with associated equipment and components, will be commissioned by the Commissioning Agent and requires related commissioning activities to be performed by Contractor:
 - .1 Architectural building components.
 - .2 Mechanical systems.
 - .3 Electrical systems.

1.6 DEFINITIONS

- .1 For the purpose of this contract, the various terms listed below, as they relate directly or indirectly to the commissioning process, shall be deemed to have the following meaning.
- .2 Commissioning Process: a planned program of tasks, activities and procedures carried out systematically during the Construction and Occupancy Stages in accordance with the commissioning objectives, specified in Paragraph 1.4.2 above, to:
 - .1 Verify whether the fully installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and;
 - .2 Ensure that appropriate documentation is compiled to effectively train O& M staff and prepare a comprehensive Building Management Manual (BMM).
- .3 Commission (i.e.: to commission a building component or system): tests and checks conducted by Commissioning Agent on all systems and integrated systems of Facility; carried out only after they are fully installed, functional and Contractor's Performance Verification responsibilities have been completed and approved.
 - .1 Contractor provides assistance during this process by operating equipment and systems, by troubleshooting and making adjustments as may be required.
 - .2 Systems are run under their full operation and under various modes to determine if they function correctly, consistently, at peak efficiency and interactively with each other as intended in accordance with Contract Documents and design criteria.
 - .3 During these checks, adjustments may be made enhancing performance to meet environmental or user requirements.

- .4 Commissioning Agent: a specifically appointed person, representing the Departmental Representative, responsible for the development of a Commissioning Plan and managing its implementation by overseeing and coordinating various activities and responsibilities to be performed by members of the Commissioning Team.
 - .1 In this project, the Commissioning Agent is part of the engineering consultant firm engaged by PWGSC to prepare the final design and contract documents for this Work.
 - .2 Commissioning Agent plays a lead role in support to the Departmental Representative to ensure that the commissioning objectives are achieved.
- .5 Commissioning Manager: a PWGSC departmental employee providing advice and guidance on commissioning requirements to the Commissioning Agent in support to the Departmental Representative.
- .6 Commissioning Plan: The document which describes the organization, scheduling, allocation of resources, required documentation, target dates, and team roles and responsibilities for verification that the built works meet Contract Document and design criteria requirements.
- .7 Contractor: means the General Contractor, however it also refers to any personnel from subcontractors, including the controls and TAB specialists, suppliers and manufacturer's technical persons which Contractor employs to carry out his/her designated commissioning duties and activities.
- .8 Design Consultant: persons from the civil, architectural, mechanical and electrical design disciplines of the engineering firm(s) which have been engaged by the Departmental Representative to prepare the final design and produce the contract documents. Design Consultant also has specifically identified commissioning activities for this project.
- .9 Design Criteria: All those factors included in the design of a Facility prescribed by the tenant needs or as determined by Designer as necessary in order to meet all Facility functional and user operational requirements
- .10 Installation/Start-up Checks:(sometimes referred to as pre-functional checks) A written compilation of checks and inspections to be performed by Contractor during the pre-start-up and start-up of a particular equipment or system component.
 - .1 Checklist sheets are produced which include the following data:
 - .1 Product manufacturer's installation instructions and recommended checks and;
 - .2 Special procedures as specified in relevant sections of Specifications;
 - .3 Other items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.
 - .2 Standard Installation/Start-up Checklist sheets prepared by equipment manufacturer are acceptable for use. However, supplement with additional data representative of specific project conditions as deemed required by Commissioning Agent.
 - .3 Use Checklist sheets for all equipment installation. Document in writing on checklist the various checks made, deficiencies noted and corrective action taken.
 - .4 Installer to sign Checklist sheets upon completion, certifying that stated checks and inspections have been performed.
 - .5 Use of Installation/Start-up Checklists shall not be considered part of the commissioning process but shall be stringently used for all equipment pre-start and start-up procedures.

- .6 Return completed Installation/Start-up Checklist sheets after use to Commissioning Agent for retention. Checklists are required by Commissioning Agent when Facility is commissioned and will be included in the BMM manual at completion of project.
- .11 Performance Verification: (sometimes referred to Functional Testing) checks, running dynamic tests and adjustments carried out by Contractor on equipment and systems, upon their installation, to ensure they operate correctly, efficiently and function independently and interactively with other systems as intended in accordance with contract documents and manufacturer's recommendations.
 - .1 Performance Verification shall not be considered part of the commissioning process. It is however considered an essential and integral part of Contractor's responsibilities in the equipment installation process which must be stringently conducted, successfully completed and approved by Departmental Representative before a piece of equipment or system is considered fully installed and functional.
 - .2 Facility components and systems will not be commissioned by Commissioning Agent until performance verification has been completed and approved.
- .12 Performance Verification Report Sheets (PV sheets): forms developed by Commissioning Agent for Contractor's use to record measured data and readings taken during functional testing and Performance Verification procedures.
- .13 Product Information (PI Data): a compilation of data gathered on a particular piece of equipment, typically produced by manufacturer, which includes nameplate information, installation/start-up instructions, parts list, operating instructions, maintenance guidelines and other pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of such equipment. This documentation is included in the Building Management Manual(BMM) at completion of work.

1.7 COMMISSIONING TEAM

- .1 A commissioning team will be assembled to carryout various functions needed to effectively commission the Facility. Contractor shall be part of this team with duties and responsibilities as specified in this section and in other sections of the Specifications.
- .2 Members of the Commissioning Team are as follows:
 - .1 Commissioning Agent
 - .2 Design Consultant
 - .3 Contractor
 - .4 Departmental Representative
 - .5 PWGSC Commissioning Manager
 - .6 PWGSC departmental personnel providing advice and project quality control to Departmental representative when required.
 - .7 Facility's operation and maintenance personnel staff as identified by Departmental Representative.
- .3 Effective commissioning requires coordination between members of the commissioning team. Cooperate with other team members in fulfilling assigned duties and as follows:
 - .1 Communicate commissioning objectives, to subcontractors, suppliers and manufacturers.
 - .2 Coordinate activities between subcontractors and trades as needed to carryout Contractor's assigned commissioning activities.

- .3 Ensure attendance of subcontractors and required specialist at commissioning meetings and during the commissioning process.

1.8 CONTRACTOR'S COMMISSIONING ACTIVITIES

.1 General:

- .1 Organize and arrange for the services of subcontractors, their specialists and manufacturer's technical representatives to perform Contractor's commissioning activities
- .2 Ensure that personnel forming part of the Commissioning Team are qualified and knowledgeable of installed equipment and systems and with design intent.
- .3 Develop in conjunction with the Commissioning Agent a commissioning schedule as specified in Article 1.11.
- .4 Notify Departmental Representative in writing when Facility is ready for be commissioned. Give 14 calendar day notice.
- .5 Commissioning will only commence once that full documentation has been received and installed equipment and systems have undergone successful performance verification.
- .6 Note that Certificate of Substantial Completion will only be issued when:
 - .1 All commissioning documentation has been received and found suitable by Departmental Representative;
 - .2 Designated equipment and systems have been commissioned and;
 - .3 Training has been completed.
- .7 Performance faults:
 - .1 Equipment and systems found not operating correctly or not performing as intended during commissioning shall be re-verified by checking 100% of all equipment and components of the unfunctional system, including related controls as required to rectify the deficiencies and ensure correct performance.
 - .2 Costs to conduct additional tests and inspections, as deemed required by Departmental Representative, to determine acceptability and proper performance of such item to be paid for by Contractor.

.2 Prior to Facility being Commissioned:

- .1 Submit commissioning documentation as specified in Article 1.13 below.
- .2 Submit the Installation/Start-up Checklist sheets to Commissioning Agent for review prior to conducting the pre-start and start-up of any piece of equipment. Incorporate additional start-up instructions onto checklist as determined by the Commissioning Agent's review.
- .3 Conduct the pre-start and start-up of all equipment by following and filling out the approved Installation/Start-up Checklists.
- .4 Conduct Performance Verification on all installed equipment and systems. Use and fill out the PV Report Sheets provided.
- .5 Upon completion of start-up and performance verification process, submit signed copy of Checklist and PV sheets to Commissioning Agent as affidavit that required checks and tests were successfully conducted.
- .6 Record performance measurements and data reading on PV sheets and return to Commissioning Agent for compilation.
- .7 Give Departmental Representative and Commissioning Agent a minimum of five (5) days' notice for start-up and performance verification of equipment and systems which must be witnessed by Commissioning Agent as determined by Commissioning Agent beforehand on PV sheets.

- .8 Provide missing information and data as identified by Commissioning Agent and Departmental Representative during documentation review.
 - .9 Submit above noted documentation before Commissioning will proceed.
 - .10 Address deficiencies in Work identified during performance verification of equipment and systems. Conduct additional performance verification thereafter.
 - .11 Arrange for special tools and devices, identified at commissioning meeting(s), as deemed required to assist with commissioning.
 - .12 Provide access ladders, two way radios and other equipment required by Team when facility will be commissioned.
- .3 When Facility is being Commissioned:
- .1 Provide qualified tradespersons to be present at site to assist Commissioning Agent for the time period and commissioning activity specified.
 - .2 Assist in commissioning architectural building component, mechanical and electrical systems specified and as follows:
 - .1 Operate designated building component, mechanical/electrical equipment and system under all modes of operation and conduct checks and tests as directed by Commissioning Agent.
 - .2 Check and verify that building component, equipment, systems and integrated systems, including their controls, are functioning and responding correctly and interactively with each other.
 - .3 Test systems independently and then in unison with other related systems.
 - .4 Conduct all Commissioning checks and tests in presence of and witnessed by Commissioning Agent and Departmental Representative.
 - .5 Assist Design Consultant and other members of the commissioning team who will also be present to commission Facility.
 - .3 Specific procedures used to commission Facility will be provided by Commissioning Agent which includes:
 - .1 Sequential order of building component and system to be tested.
 - .2 Running systems under various anticipated modes and demands (example: high and low cooling or heating loads, duplicating outside temperature conditions, fire alarm and power failure conditions etc.).
 - .3 Running building controls through all sequences of operation to verify and confirm that equipment and systems are responding as designed and intended.
 - .4 Operating designated equipment at peak capacities, recording output data against design criteria.
 - .4 Run component or systems as long as necessary to effectively commission all items as deemed required by Commissioning Agent and Departmental Representative.
 - .5 Monitor equipment and system responses.
 - .6 Record test results, measurements and other data on commissioning forms provided by Commissioning Agent.
 - .7 Assist in analysing results. Identify system deficiencies and components not responding as intended.
 - .8 Correct deficiencies and system non-conformance issues. Adjust, calibrate or fine tune system components as required. Debug system software as may be required.
 - .9 Retest systems when directed to confirm compliance.

- .4 Upon completion of Facility Commissioning:
 - .1 Provide training to maintenance & operational personnel as specified in Article 1.12 below.
 - .2 Turn over any filled-in checks sheets or reports resulting from commissioning.
- .5 During Warranty period at Occupancy Stage:
 - .1 After 10 months has elapsed from the commencement of the warranty period, conduct commissioning checks on building components and systems:
 - .2 Fine tune components, systems and integrated systems and continue system debugging to optimize Facility performance.
 - .3 Rectify warranty issues.
 - .4 Submit written report to Commissioning Agent and Departmental Representative.
 - .1 Indicate results noted and corrective action taken.
 - .2 Note improvements made to operating parameters and control settings.
 - .3 Recommend modifications deemed advisable to improve performance, environmental conditions, energy consumptions and other issues.
 - .5 Commissioning Agent and other team members as determined by Departmental Representative to be present during such work.

1.9 COMMISSIONING ACTIVITIES OF OTHER TEAM MEMBERS

- .1 Commissioning Agent:
 - .1 Represents the Departmental Representative during the commissioning process.
 - .2 Coordinates activities of the commissioning team members to ensure that commissioning activities are carried out properly and in a timely manner.
 - .3 Prepares commissioning schedule in concert with Contractor.
 - .4 Chairs commissioning meetings.
 - .5 Works with Contractor, subcontractors, equipment suppliers, Design Consultant resources, PWGSC and Tenant Representatives to resolve technical problems which may arise during the process.
 - .6 Witnesses Contractor's pre-start, start-up and performance verification procedures for certain equipment and systems specified when deemed required due to their critical nature and function in the Facility.
 - .7 Verifies that Installation/Start-up Checklists and Performance Verification checks and tests are used and stringently followed by Contractor.
 - .8 Assists Contractor in coordination of training activities for facility staff.
 - .9 Submits final commissioning report to Departmental Representative.
- .2 Design Consultant:
 - .1 Prepares in concert with Commissioning Agent the Commissioning Plan.
 - .2 Reviews Contractor's Installation/Start-up Checklists for completeness, incorporating supplement data not addressed on checklist. Provides to Contractor checklist for products which manufacturer does not provide installation and start-up instructions.
 - .3 Develops performance verifications report sheets for use by Contractor to record actual data and measurements against design data criteria.
 - .4 Includes, on performance verification report sheets, design data and anticipated performance values for equipment and systems to undergo verification.
 - .5 Compiles commissioning documentation submitted by Contractor. Prepares final Building Management Manuals.

- .6 Assists Commissioning Agent in witnessing pre-start, start-up and performance verification activities.
- .7 Approves type and method of calibration for instruments used by Contractor to conduct performance verification and commissioning tests.
- .8 Assists Commissioning Agent in reviewing and analysing tests results.
- .9 Participate in the training sessions provided by Contractor to tenant O&M staff by giving introductory information on design philosophy, design intent and systems designs,
- .10 Assist in the resolution of issues relating to commissioning.
- .3 Tenant Representative:
 - .1 Participates with other team members to ensure that systems as installed meet the operational and functional requirements.
 - .2 Periodically attends commissioning meetings as required.
 - .3 Attends final commissioning activities.
 - .4 Assists in resolving technical problems by providing additional details on operational requirements.
- .4 Facility Operations and Maintenance Staff:
 - .1 Participates in the commissioning process to obtain early introduction to the facility systems and to provide early operator feedback.
 - .2 Prime interest is in the familiarization and training of appropriate maintenance staff.
 - .3 Staff may attend certain critical equipment start-up and performance verification activities and provide comments and practical suggestions on issues which may arise during actual operation, maintenance and repair of the equipment and systems.
 - .4 Attends commissioning meetings periodically, depending on issues being discussed.
 - .5 Identifies the appropriate staff which must receive the O&M training.

1.10 COMMISSIONING MEETINGS

- .1 General briefing on commissioning will be conducted at first project construction meeting at commencement of work.
 - .1 Issues discussed will include scope and extent of commissioning and clarify responsibilities of commissioning team members.
 - .2 All team members must attend, including subcontractors of equipment and systems to be commissioned.
- .2 Include commissioning as one agenda item at each construction meeting held and chaired by Contractor during construction. Give subject due consideration for each material and equipment supplied and for all matters of Work.
- .3 At the 60% construction completion stage, as determined by Departmental Representative, a separate commissioning scope meeting will be called by Departmental Representative to review progress of work, discuss schedule of equipment start-up activities and prepare for upcoming commissioning. Issues at meeting will include:
 - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
 - .2 Determine the degree of involvement of each trade and manufacturer's representatives in the commissioning process.

- .4 Separate commissioning meetings will be held from the 60% construction stage to project completion. Meetings are tentatively scheduled to be held on a bi-monthly basis but may be more frequent during the equipment start-up and functional testing period.
- .5 Whenever possible meetings will be held immediately following the construction meetings.
- .6 Meeting will be chaired by Departmental Representative, who will record and distribute minutes.
- .7 Ensure that all subcontractors and relevant manufacturer representatives are present at the 60% commissioning scope meeting and at other meetings as deemed required.

1.11 COMMISSIONING SCHEDULE

- .1 Address commissioning activities within the construction work schedule. Clearly identify allocated time period for commissioning and training activities.
- .2 Provide a separate independent commissioning schedule at the 60% construction stage in order that specific issues and individual details of commissioning can be reviewed, discussed and dealt with from that period onward to project completion. Submit monthly updates thereafter,
- .3 Develop commissioning schedule in conjunction with Commissioning Agent. Indicate allocated time period and anticipated dates for:
 - .1 Submission of commissioning documentation, including O&M Manuals.
 - .2 Equipment and system start-up and performance verification, making them ready to be commissioned.
 - .3 Allocated period to commission designated building components and systems.
 - .4 Training period.
 - .5 Work during Warranty period.
- .4 Submit schedule to Departmental Representative for review.

1.12 TRAINING

- .1 Commence process of familiarizing Tenant and O&M personnel in the early stages of work on purpose and operation of various equipment and systems. Continue process throughout the entire construction duration.
 - .1 Provide informal briefings during occasional site visits, at planned commissioning meetings and during the final commissioning site activities.
- .2 Conduct formal demonstration and training sessions only after all identified systems have been commissioned by Commissioning Agent and Departmental Representative has given approval to proceed with the training process.
- .3 Carryout training in accordance with requirements of section 01 79 00 - Demonstration and Training .
- .4 Submit written agenda of training session(s) four (4) weeks beforehand for review by Commissioning Agent and Departmental Representative.
- .5 Coordinate content with Commissioning Agent. Design Consultant will provide introductory presentation giving general outline of each system design and intended function.
- .6 Submit training manuals for review two (2) weeks prior to actual training.
- .7 Ensure required tools and O&M Manuals are on site for training and system demonstration.

- .8 As a minimum, the training sessions to cover the following information:
 - .1 Introduction.
 - .2 Description of the system with factory personnel being involved at appropriate times.
 - .3 Instructions on start-up procedures including seasonal procedures, system checklists and emergency procedures.
 - .4 Operational procedures, including occupancy considerations, seasonal change-over, manual and automatic operations and emergency modes.
 - .5 Instruction on system shutdowns, including checklists.
 - .6 Instructions on all aspects of system maintenance, including routine servicing, lubrication, overhaul and factory servicing.
 - .7 Information concerning the scope of warranties and their use.
 - .8 A description of spare parts in stock and their service.
 - .9 A description of normal tools required for servicing the systems/equipment.
- .9 Submit typewritten record of training sessions given and list of attendees. Use forms of format approved by Departmental Representative.

1.13 COMMISSIONING DOCUMENTATION

- .1 Submit the following documentation for use during commissioning and for incorporation thereafter into a Building Management Manual (BMM):
 - .1 Operations and Maintenance Manuals, Project Record Documents and other data as specified in Section 01 78 00 - Closeout Submittals. Data to include:
 - .1 Equipment Product Information (PI Data) complete with:
 - .1 Nameplate info,
 - .2 Installation instructions,
 - .3 Operating procedures and
 - .4 Maintenance guidelines.
 - .2 Reviewed shop drawings,
 - .3 As-built record drawings and Specifications.
 - .2 Completed Installation/Start-up Checklist sheets used.
 - .3 Performance Verifications checks and tests procedures and completed report sheets used.
 - .4 Copy of any static and dynamic test and reports conducted.
 - .5 TAB report and other reports as specified in various trade sections.
- .2 Above documentation is required by Commissioning Agent to commission Facility. Submit data minimum three (3) weeks before commencement of commissioning.
- .3 Documentation to include detailed information and number of copies as specified for maintenance manuals of section 01 78 00 - Closeout Submittals.
- .4 Commissioning Agent and Design Consultant will compile above documentation and produce a BMM manuals for operation/maintenance staff and tenant use.

END OF SECTION